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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,896	09/29/2003	Sandor Nagy	88-2052A	1978

24114 7590 08/09/2005

LYONDELL CHEMICAL COMPANY  
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EXAMINER

LEE, RIP A

ART UNIT PAPER NUMBER

1713

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/673,896

Applicant(s)

NAGY ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5 and 8-14 is/are rejected.
- 7) ☒ Claim(s) 4, 6 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01-09-04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-3, 5, 8, and 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Shim *et al.* (*J. Organomet. Chem.*, 2003<sup>†</sup>).

The zwitterionic complex,  $[\text{PhC}(\text{O})\text{-C}_6\text{H}_4\text{-N}=\text{C}(\text{Ph})\text{OB}(\text{C}_6\text{F}_5)_3\text{-}\kappa^2\text{P},\text{O}]\text{Ni}(\eta^3\text{-CH}_2\text{C}_6\text{H}_5)$  (5), possesses the requisite structural features recited in the claims. Notably, the heteroatom bound to the metal center is also bound directly to a substituent containing a boron atom that bears a negative formal charge, and the metal center has a positive formal charge. Compound 5 catalyzes the polymerization of ethylene.

5. Claims 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shim *et al.* in view of Lee (U.S. 6,803,433).

Shim *et al.* teaches use of zwitterionic catalysts for the polymerization of ethylene and norbornene, but there is no teaching of polymerization of polar monomers. The prior art of Lee relates to use of a series of similar zwitterionic nickel complexes for olefin polymerization. As with the complexes of Shim *et al.*, Lee activates precursor complexes by reacting them with  $\text{B}(\text{C}_6\text{F}_5)_3$  (see Example 2). Lee teaches that these zwitterionic catalysts may be used for polymerizing or copolymerizing olefins (col. 7, line 11). Representative olefins include ethylene, propylene, norbornene, and the polar (co)monomer, 3-chloromethylstyrene (col. 7, line 10). Although Shim *et al.* alone does not teach copolymerization of ethylene with other monomers, one of ordinary skill in the art would have found it obvious to arrive at the subject matter of claim 10 because Lee teaches that related catalysts have such utility. Since the catalysts are similar, one of ordinary skill in the art would have reasonably expected such an embodiment to produce copolymer successfully. The subject matter of claims 12-14 are obvious over Lee because the prior art shows that supported zwitterionic catalysts are readily prepared for gas phase and slurry phase reaction conditions (col. 14, lines 32-35). One of ordinary skill in the art would have found it obvious to use the catalysts of Shim *et al.* in slurry/gas phase operations by supporting the metal complex because this practice is taught and shown to work in Lee.

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<sup>†</sup> Published May 30, 2003.

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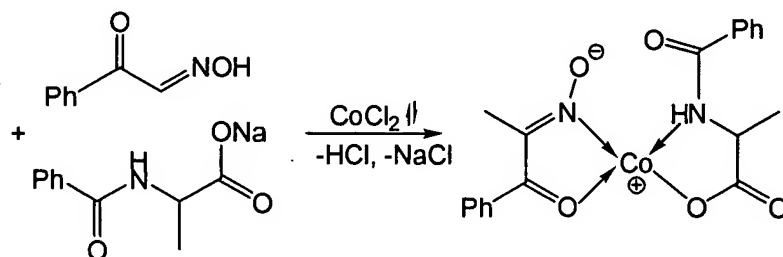
6. Claims 10-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shim *et al.* in view of Wang *et al.* (U.S. 6,897,275).

Shim *et al.* teaches use of zwitterionic catalysts for the polymerization of ethylene and norbornene, but there is no teaching of polymerization of polar monomers. The prior art of Wang *et al.* relates to use of a similar zwitterionic nickel complexes for olefin polymerization. As with the complexes of Shim *et al.*, Wang *et al.* activates precursor complexes by reacting them with  $B(C_6F_5)_3$  (see compound 24, col. 47). Wang *et al.* teaches that this zwitterionic catalyst may be used for copolymerizing olefins with polar-group containing olefins and CO (col. 16, lines 23-38). Acrylates are especially preferred polar monomers (abstract). Although Shim *et al.* alone does not teach copolymerization of ethylene with other monomers, one of ordinary skill in the art would have found it obvious to arrive at the subject matter of the instant claims 10 and 11 because Wang *et al.* teaches that related catalysts have such utility. Since the catalysts are similar, one of ordinary skill in the art would have reasonably expected such an embodiment to produce copolymer successfully. The subject matter of claims 12 and 14 are obvious over Wang *et al.* because the prior art shows that supported zwitterionic catalysts are readily prepared for gas phase and slurry phase reaction conditions (col. 20, lines 36-56). One of ordinary skill in the art would have found it obvious to use the catalysts of Shim *et al.* in slurry/gas phase operations by supporting the metal complex because this practice is taught and shown to work in Wang *et al.*

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7. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Thakkar *et al.* (*J. Indian Chem. Soc.*, 1995).

Thakkar *et al.* discloses cobalt complexes containing an aldoximato ligand prepared by refluxing  $\text{Co(II)Cl}_2$  in the presence of isonitrosoacetophenone (phenylglyoxaldoxime) and amino acid (page 422). The product, in which the metal bears a positive formal charge and the metal-bound heteroatom contains a substituent with a negative formal charge, is zwitterionic. A full structure of a complex derived from *N*-benzoylalanine amino acid has been provided below for Applicant's convenience (see also HCAPLUS abstract).



8. Claims 4, 6, and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The claims describe further the structure of the zwitterionic metallocycle. None of these structural features are taught or suggested in Shim *et al.*, and one of ordinary skill in the art would not have found it obvious to modify the existing compound, even in view of the secondary references cited herein, accordingly in order to arrive at the subject matter of the instant claims.

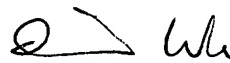
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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August 5, 2005



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